

**FIG. 1A**



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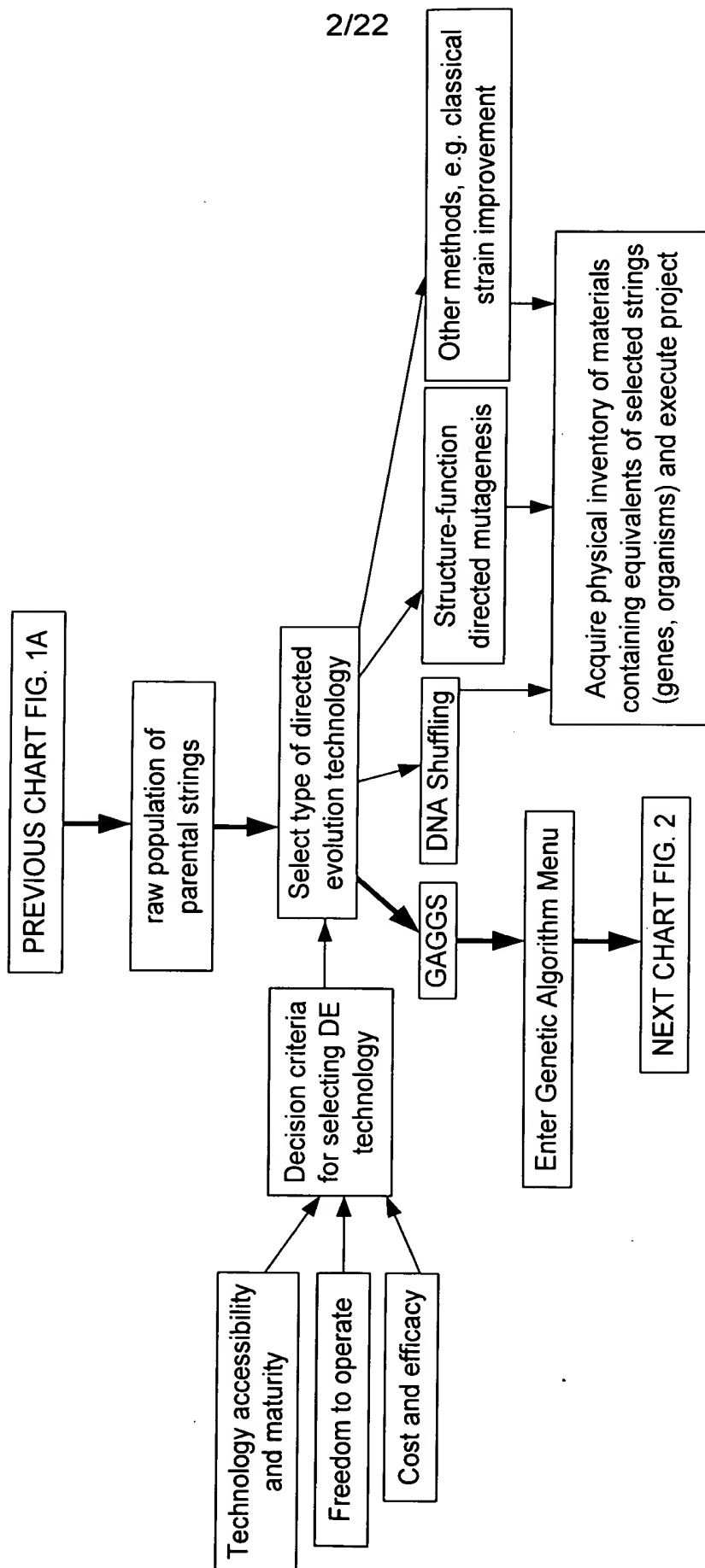


FIG. 1B



# REPLACEMENT SHEET

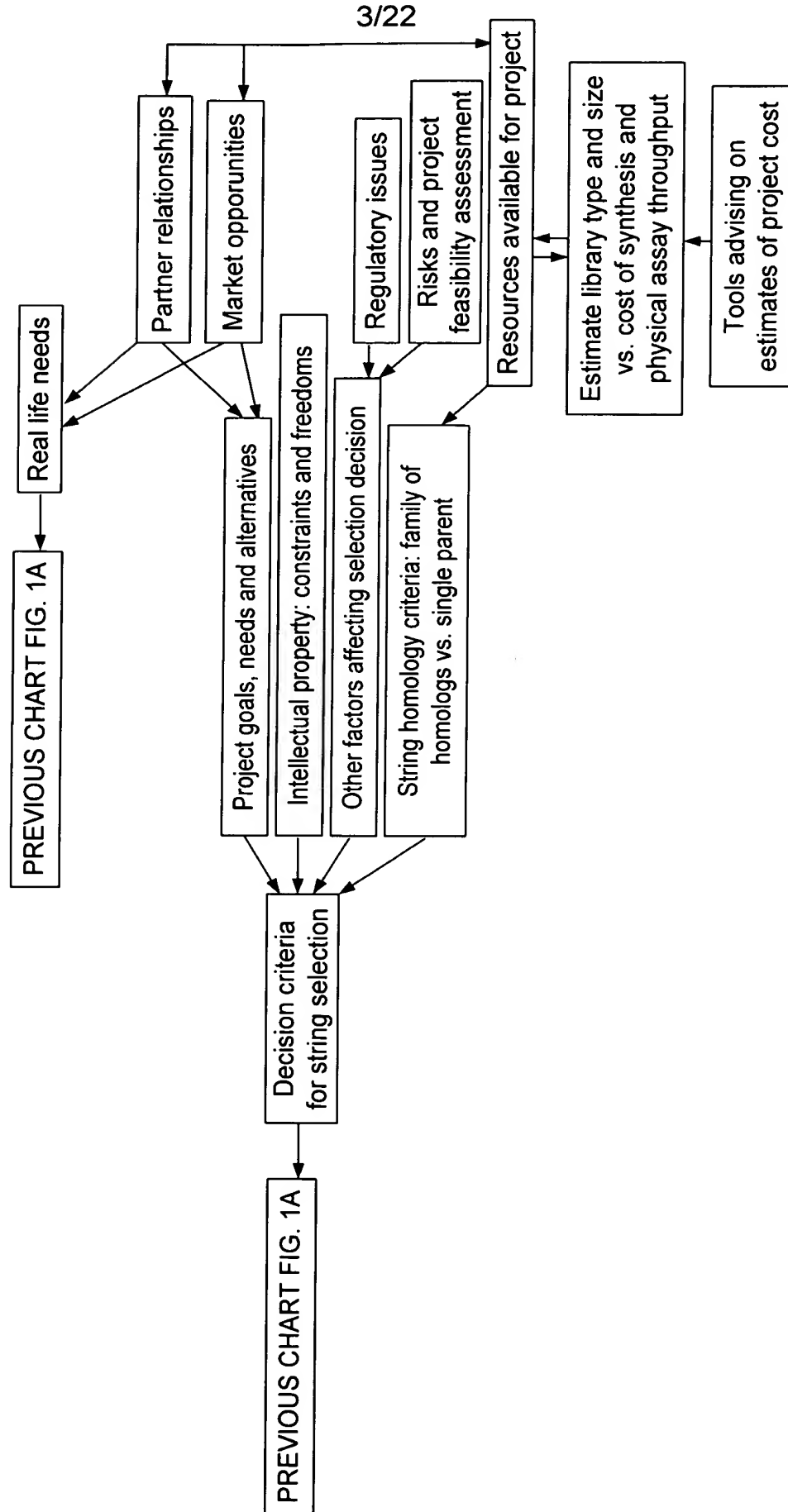
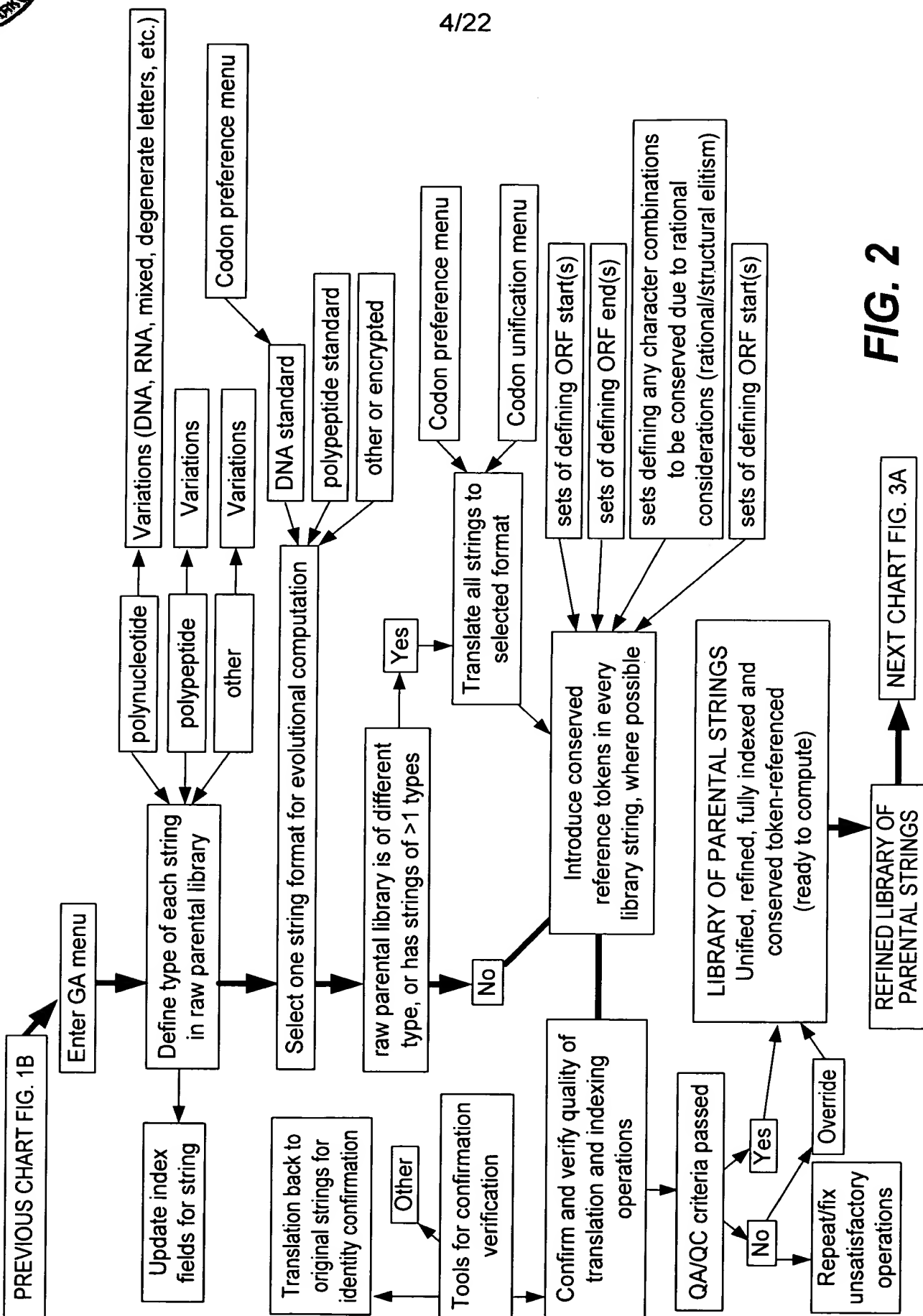
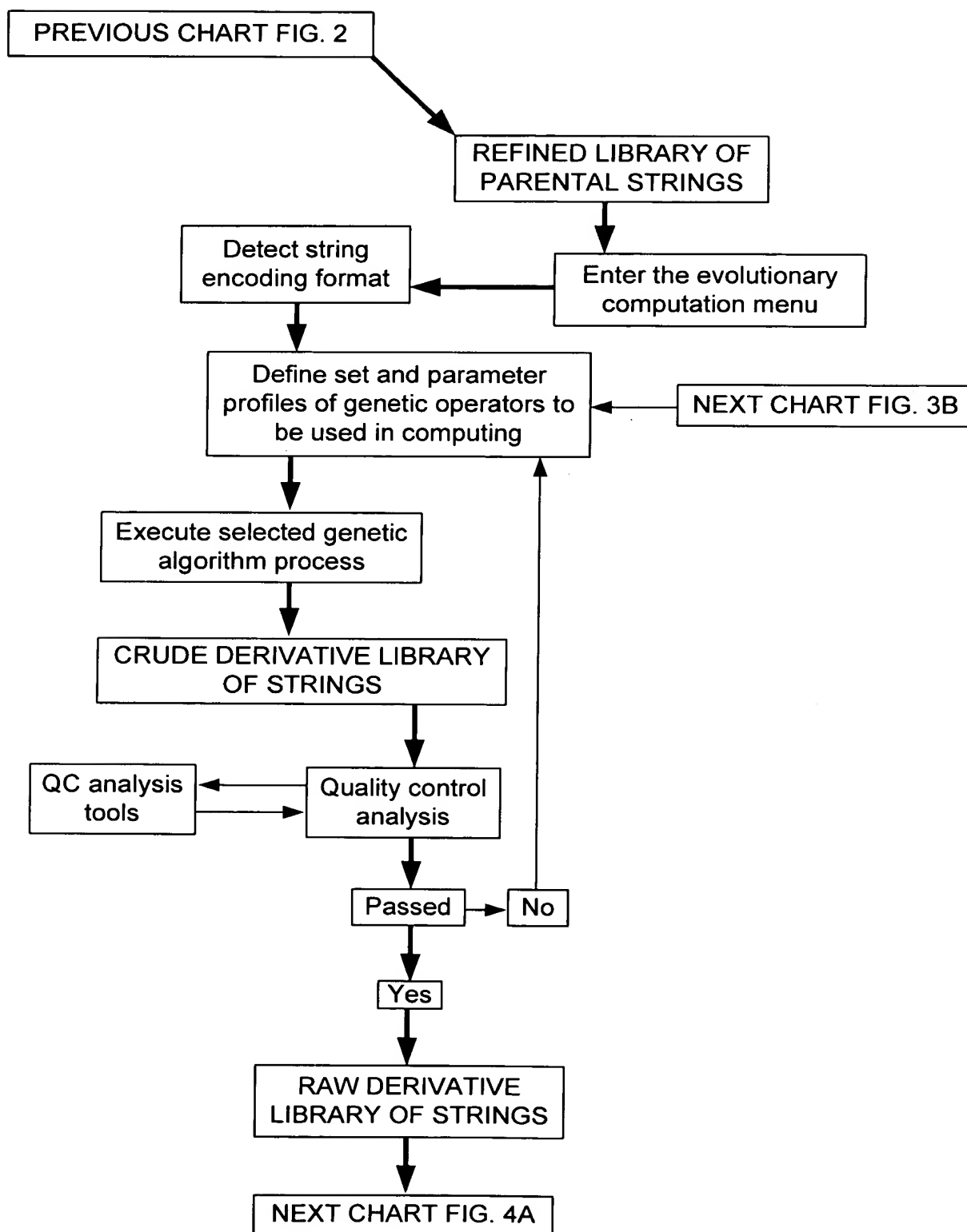


FIG. 1C

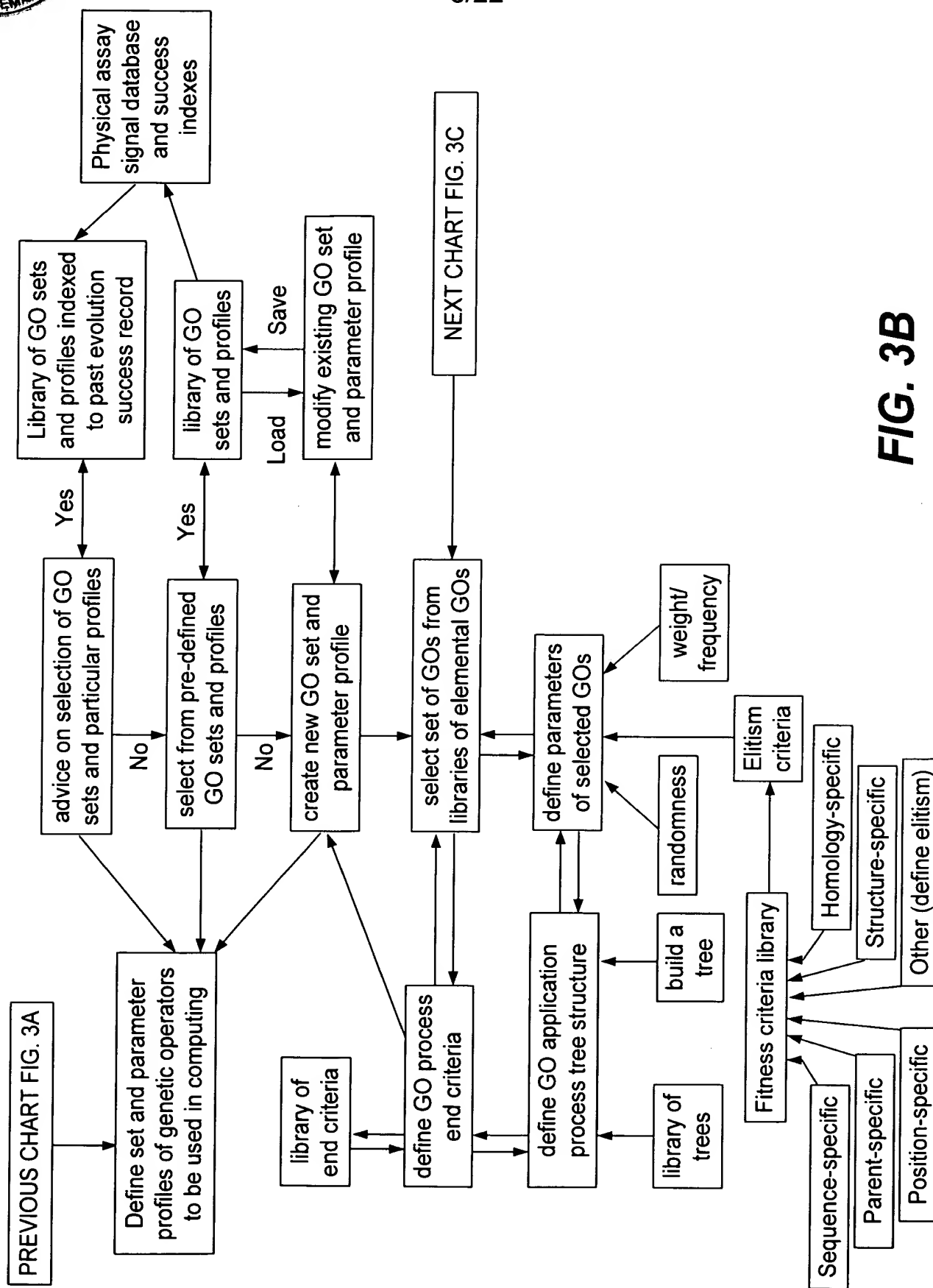
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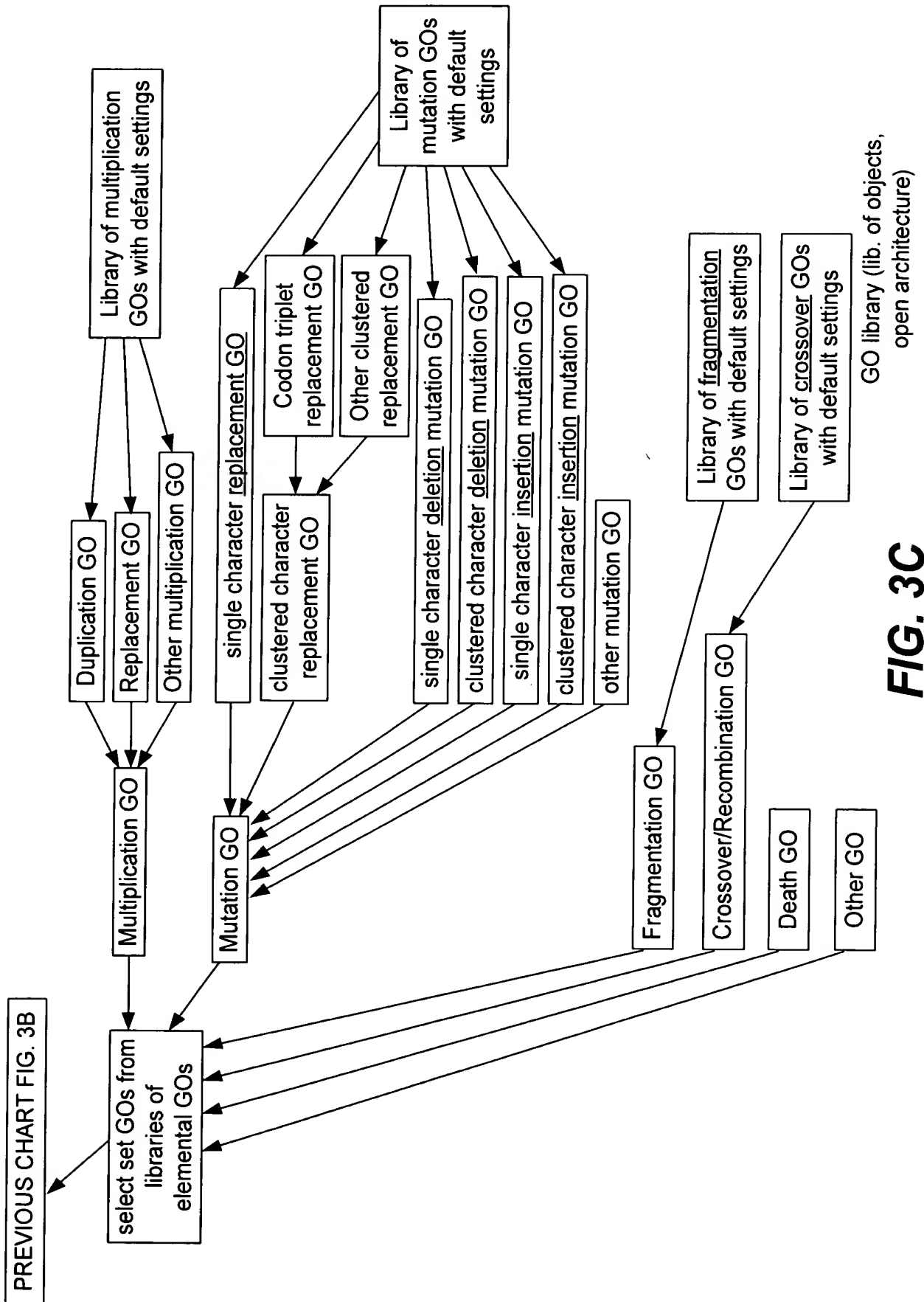


**FIG. 2**



**FIG. 3A**





**FIG. 3C**

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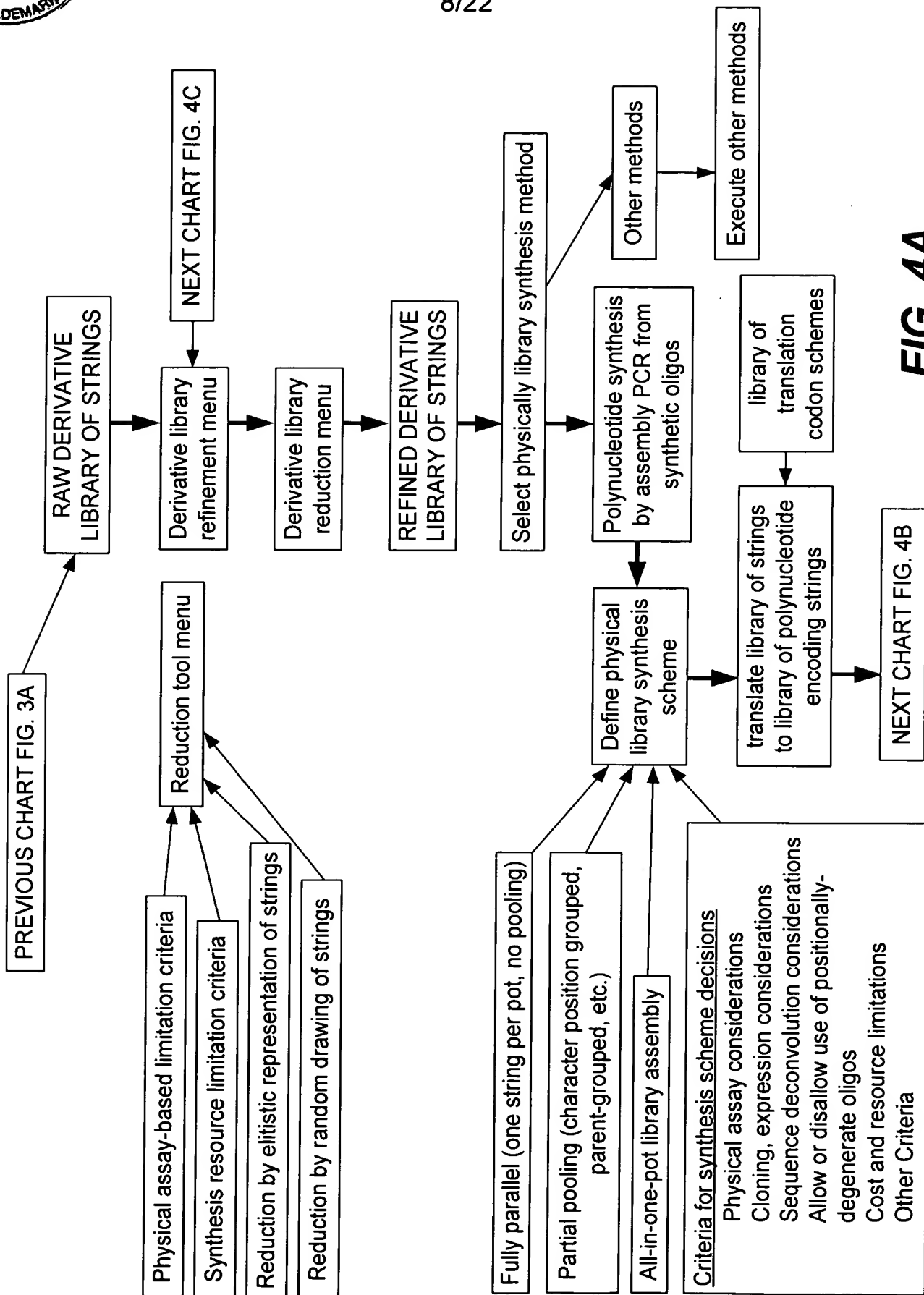
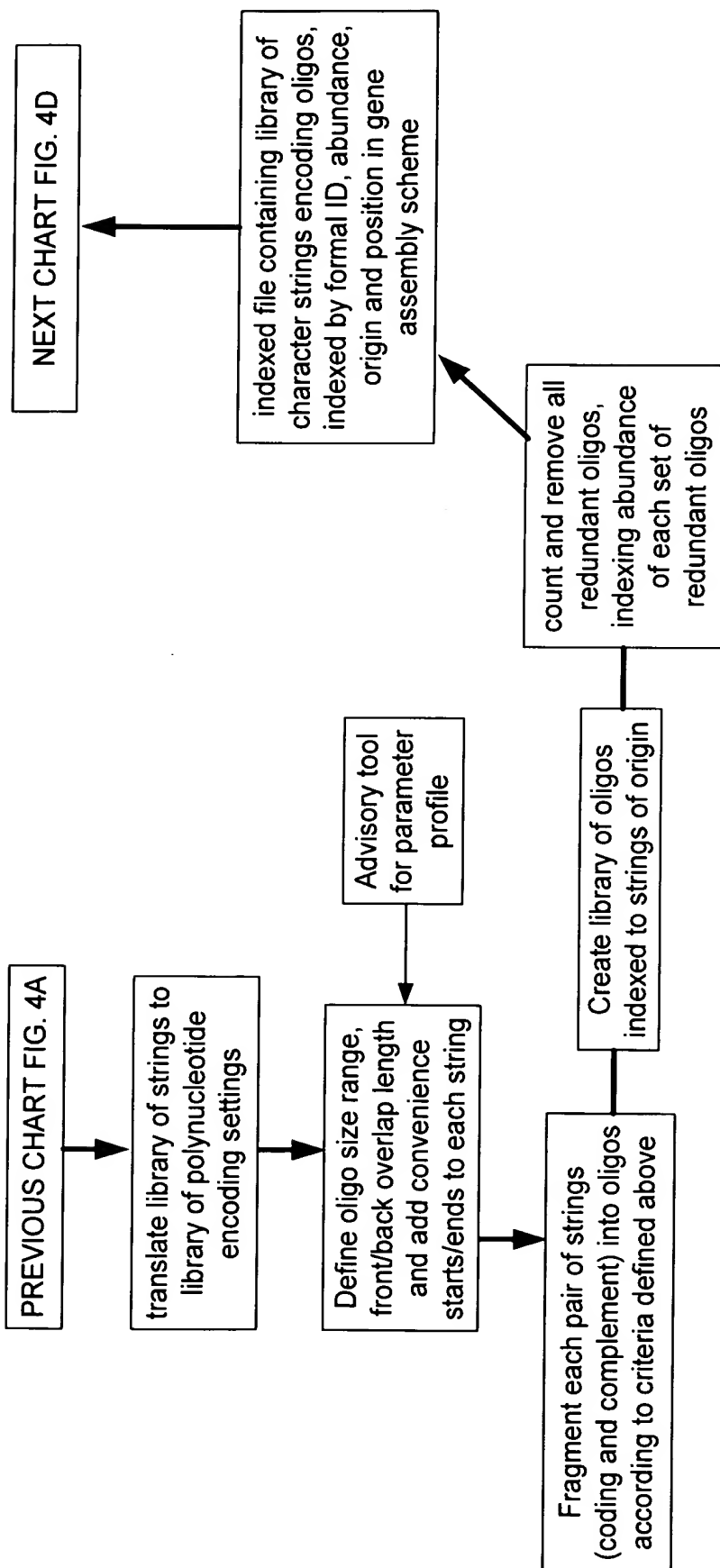


FIG. 4A

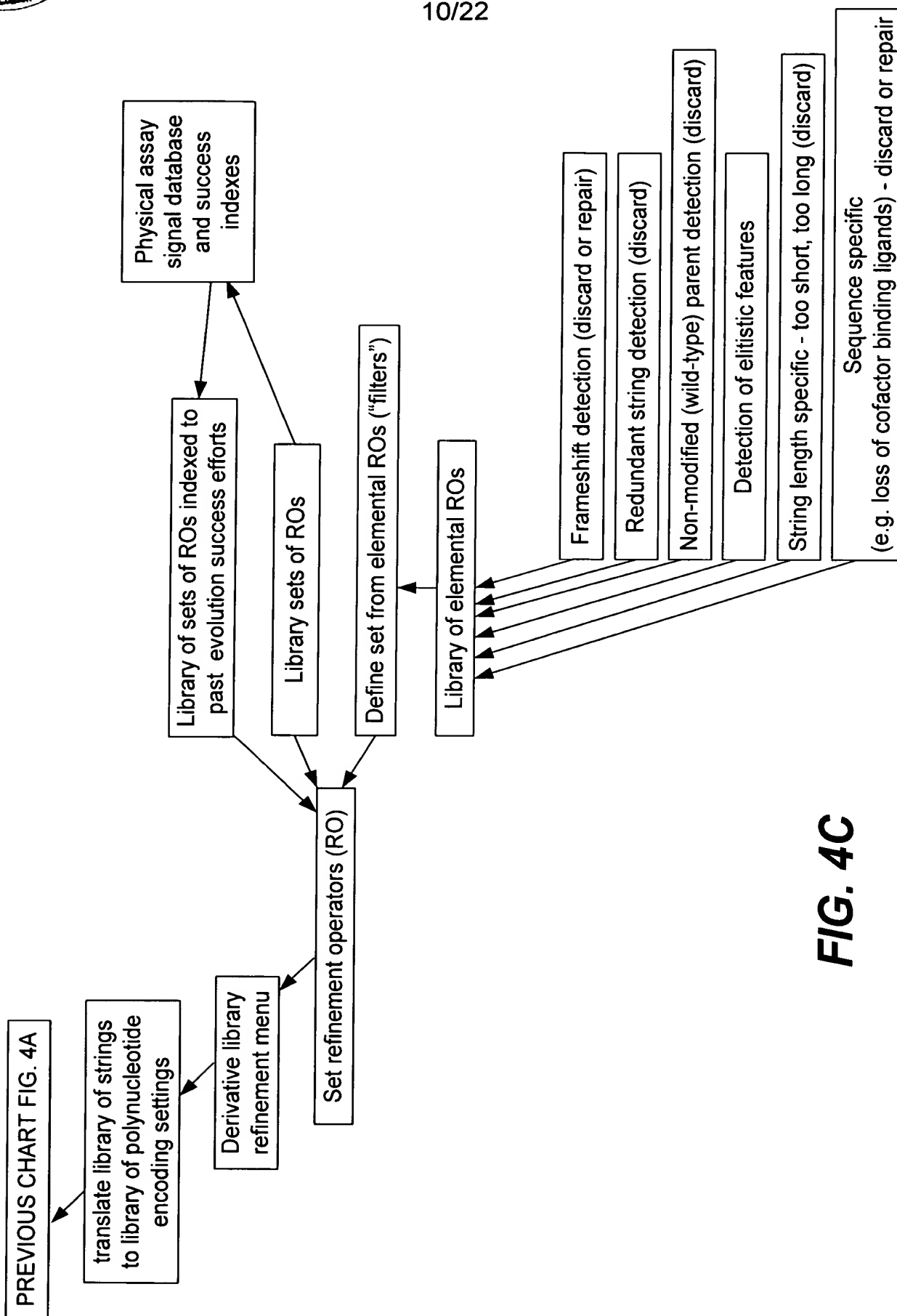


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**FIG. 4B**

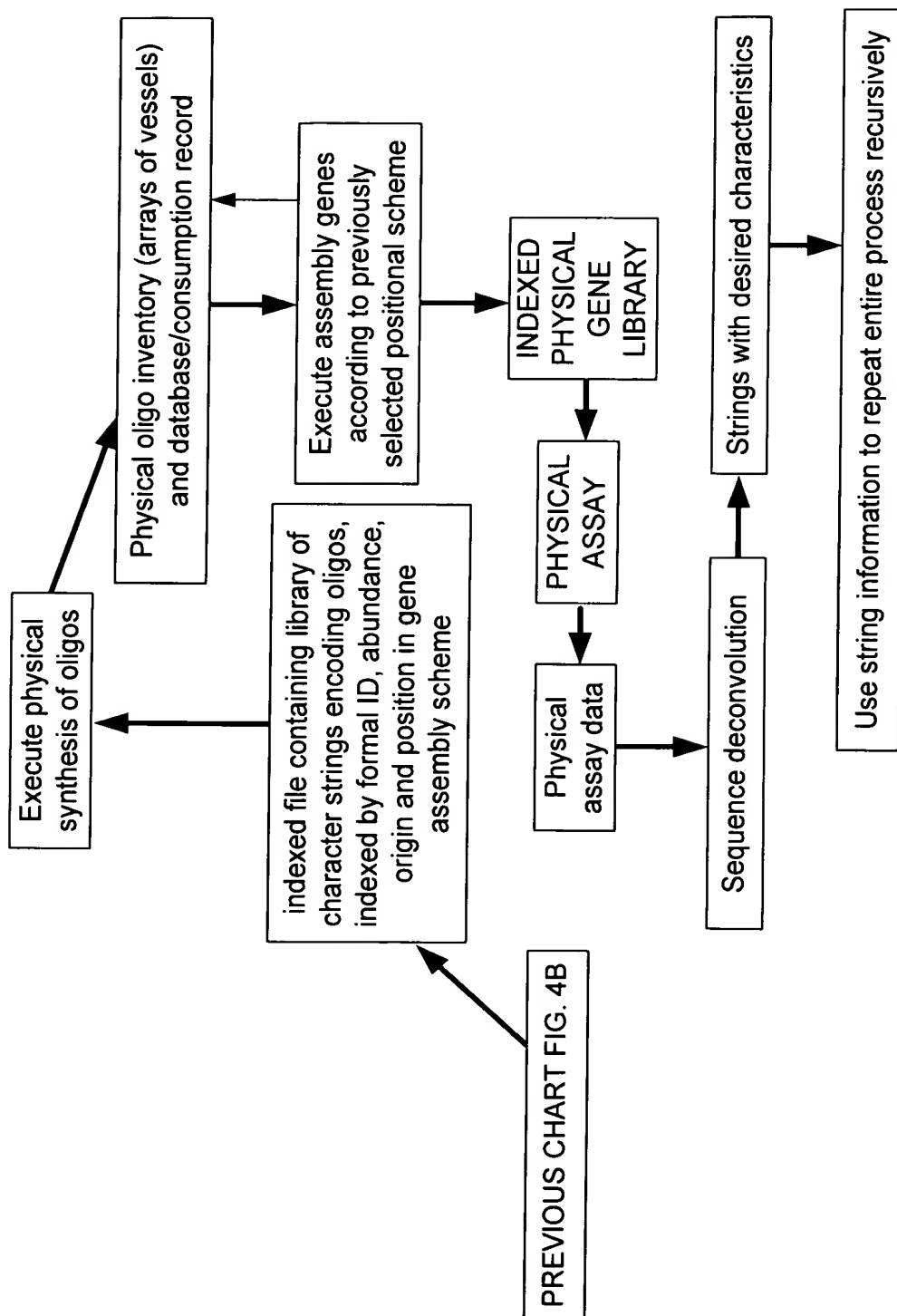
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**FIG. 4C**



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**FIG. 4D**



REPLACEMENT SHEET

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Percent Similarity

	1	2	3	4	5	6	7	
1		62.1	81.4	57.6	81.8	56.1	59.1	1 A27211 synthetic 309.PM
2	50.5		61.0	54.9	59.5	58.2	60.8	2 BACAPRQ subtilisin. PM
3	21.0	52.0		54.6	78.4	50.6	53.2	3 BACAPRS subtilisin.PM
4	54.4	63.3	62.3		52.0	64.6	67.9	4 BACSBTL subtilisin.PM
5	20.5	54.9	25.1	65.6		53.9	56.5	5 BACYAB subtilisin alk. PM
6	58.6	56.6	72.2	44.2	63.4		94.9	6 BLSC11594 subtilisin.PM
7	52.5	51.4	66.0	38.5	57.8	4.9		7 I82494 keratinase.PM
	1	2	3	4	5	6	7	

FIG. 5A

BACAPRS subtilisin.PM  
BACYAB subtilisin alk.PM  
A27211 synthetic 309.PM  
BLSC11594 subtilisin.PM  
I82494 keratinase.PM  
BACSBTL subtilisin.PM  
BACAPRQ subtilisin.PM

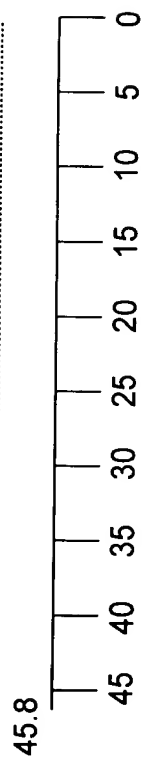


FIG. 5B



REPLACEMENT SHEET

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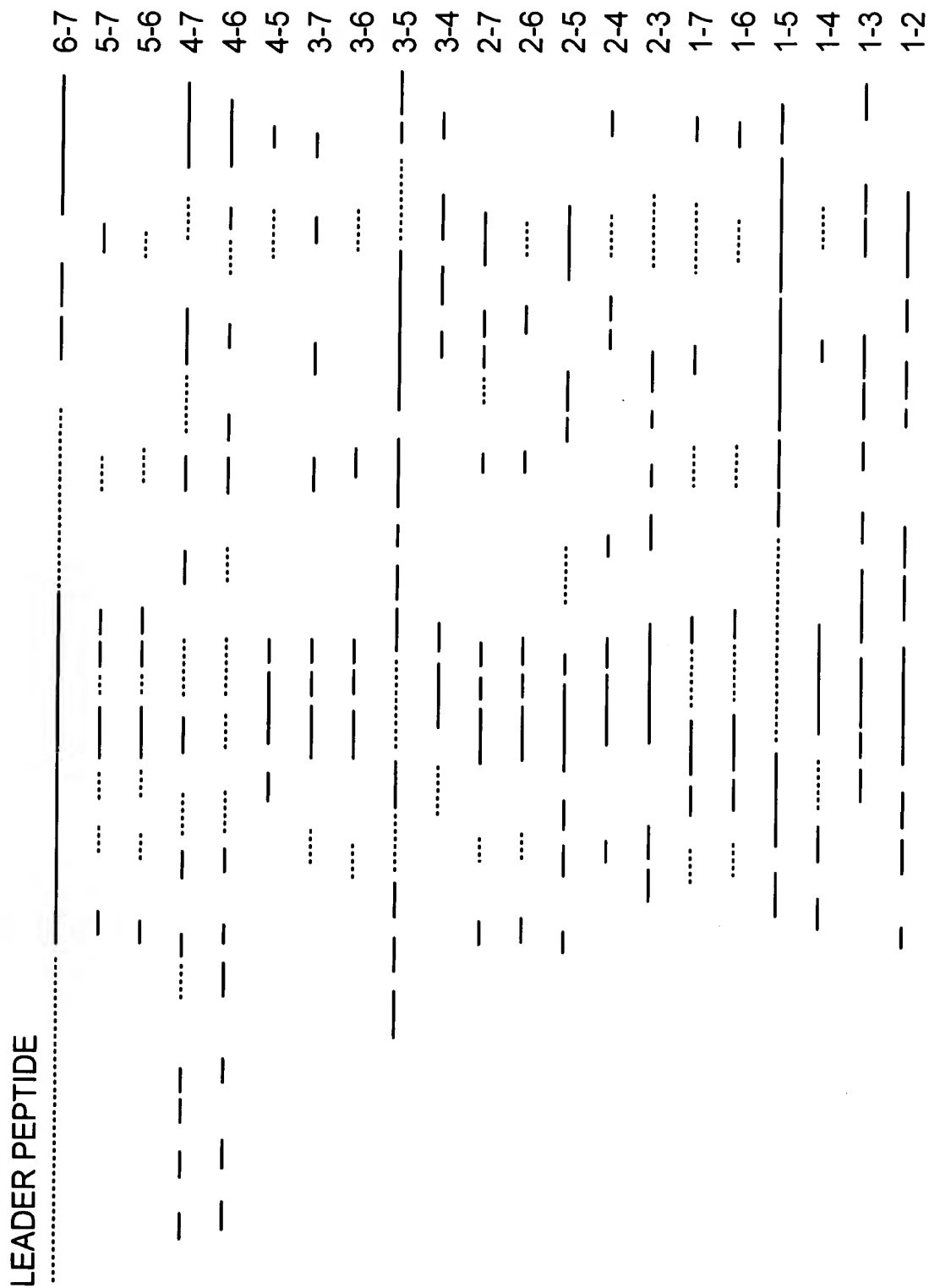


FIG. 6



REPLACEMENT SHEET

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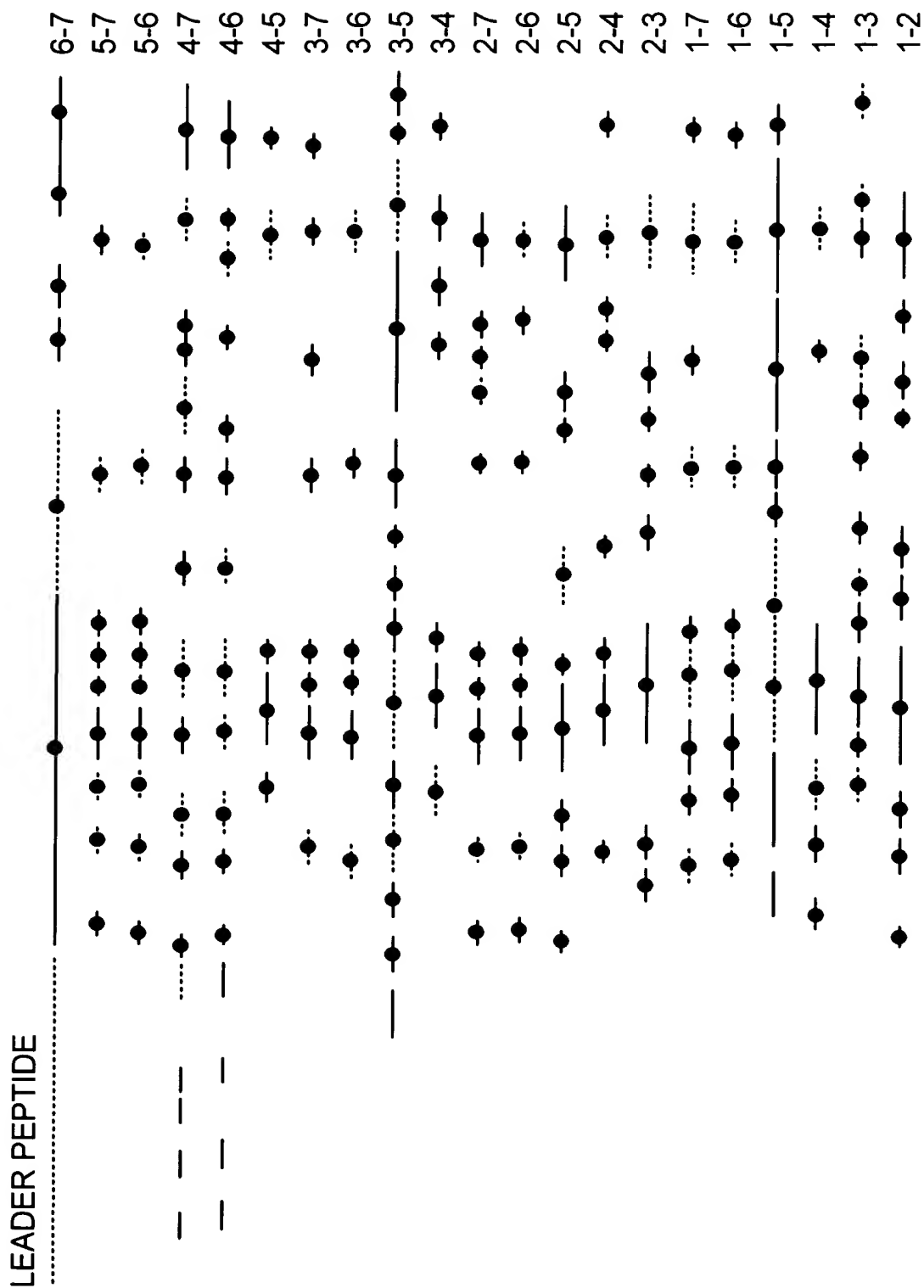
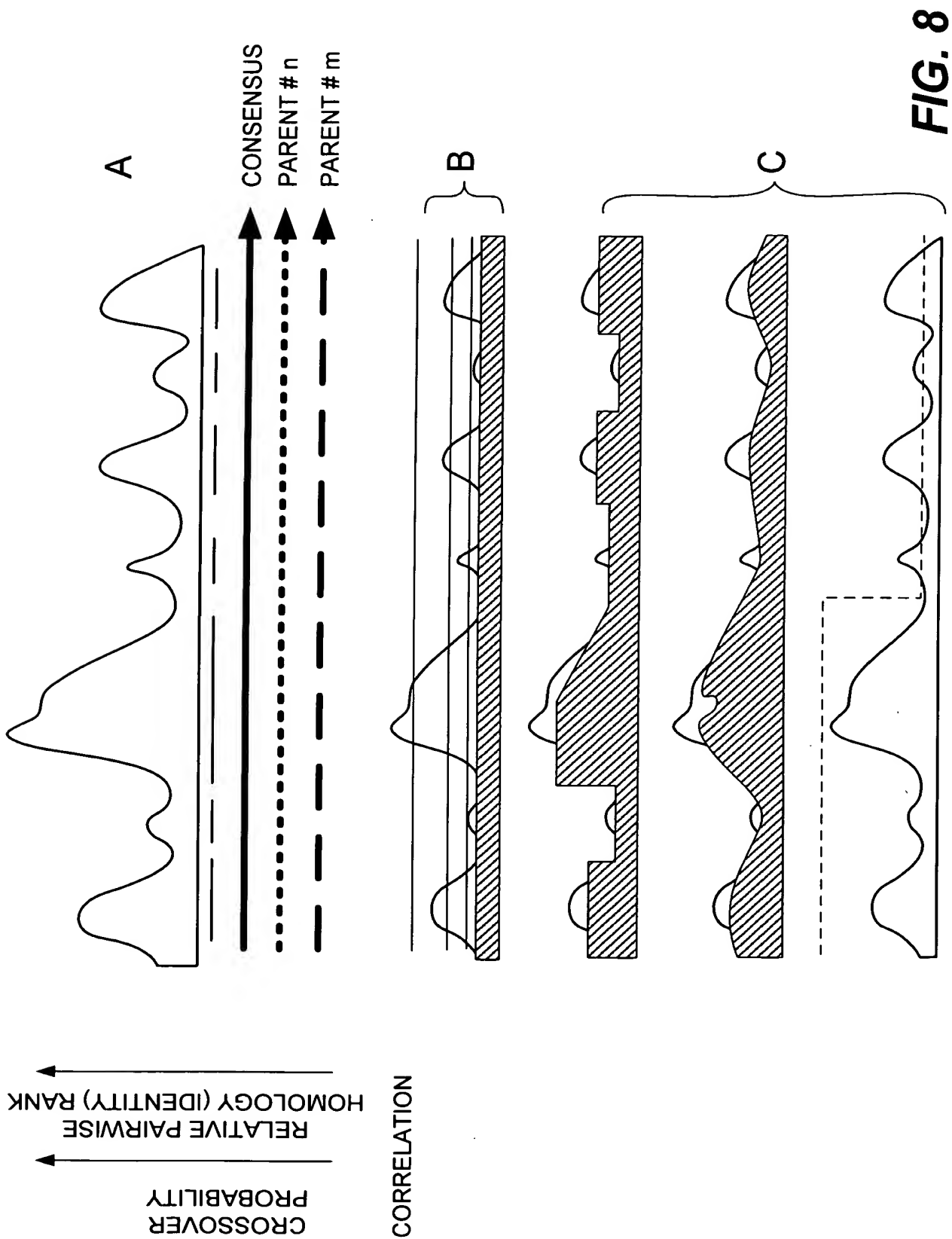


FIG. 7





# REPLACEMENT SHEET

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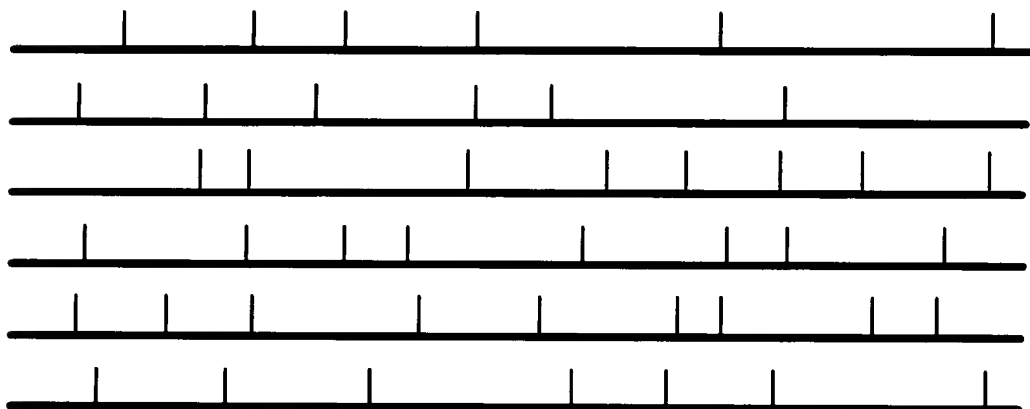
Introducing indexed crossover points marker into sequence of each of the parents

5' ————— 3'



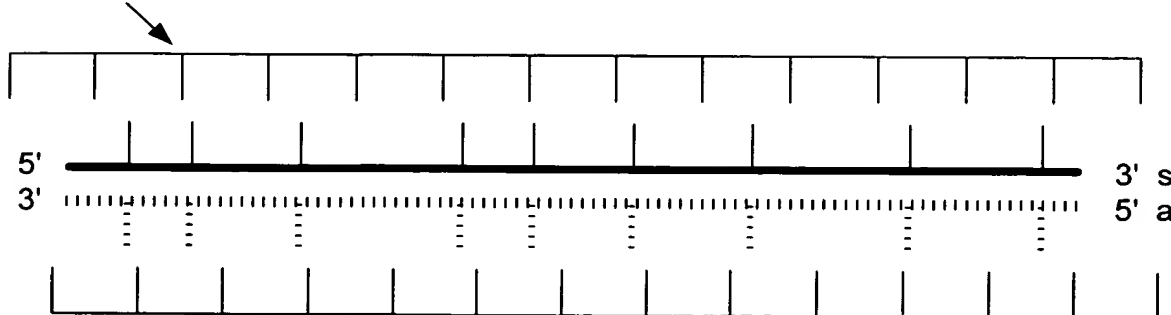
5' ———|———|———|———|———|———|———|———|———|———|———|——— 3'

| = positional index of crossover point (marker field)  
contains: parent (m) ID, position # ("head") AND parent (n) ID, position # ("tail")



5' ———|———|———|———|———|———|———|———|———|———|———|——— 3' s  
3' .....|.....|.....|.....|.....|.....|.....|.....|.....|.....|.....|..... 5' a

Oligo grid index



**FIG. 9**

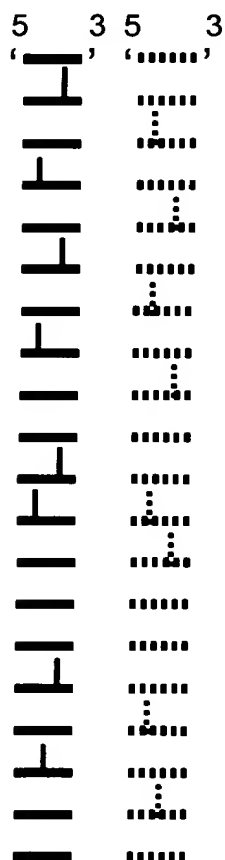




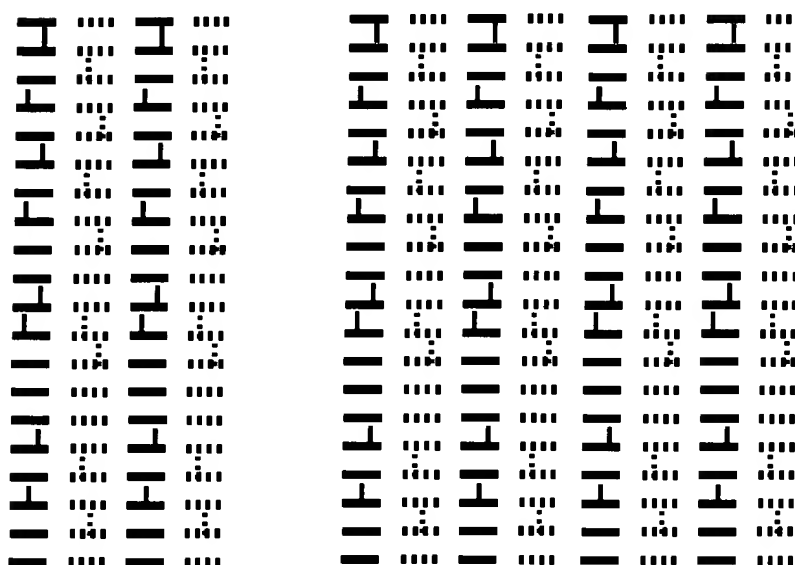
REPLACEMENT SHEET

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SET OF OLIGOS TO  
ASSEMBLE A PARENT



COMPLETE INVENTORY OF  
OLIGO SEQUENCES  
(TO ASSEMBLE ALL PARENTS)



FIND ALL PAIRS OF PAIRS OF  
OLIGO SEQUENCES WITH  
MATCHING PAIRWISE  
CROSSOVER INDEXES

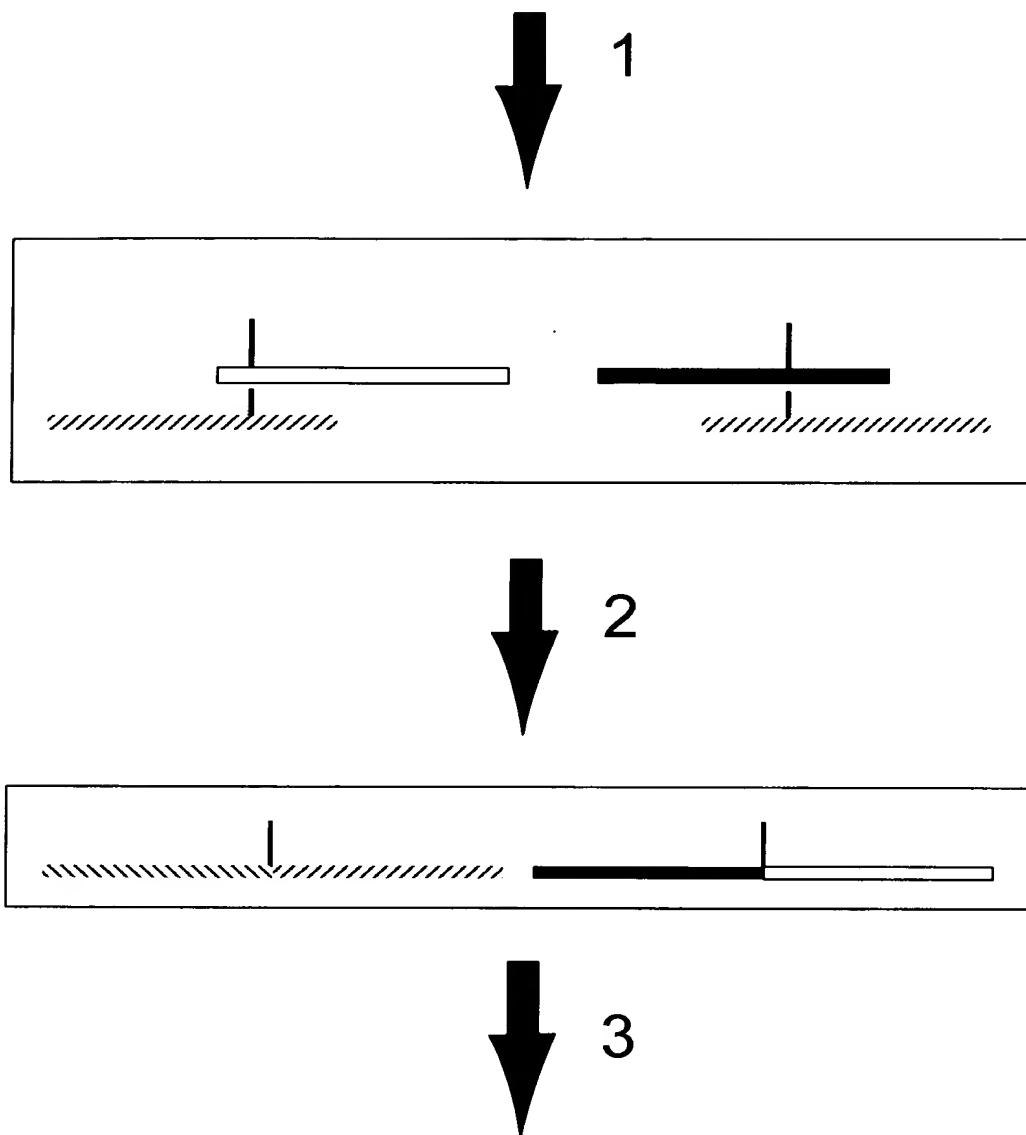
SUB-INVENTORY OF OLIGOS  
WITH CROSSOVER MARKERS

**FIG. 10**



REPLACEMENT SHEET

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**FIG. 11**



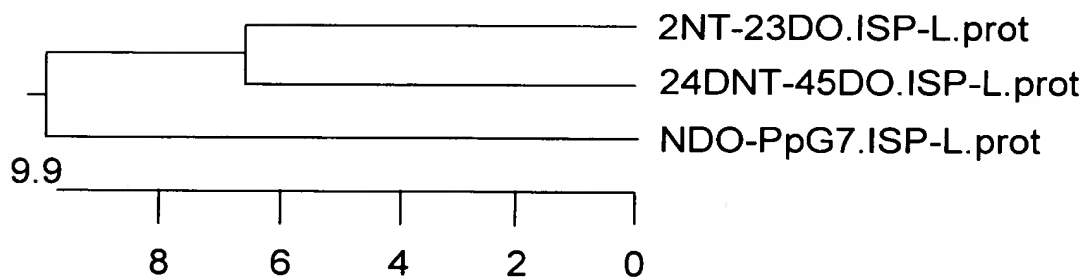
# REPLACEMENT SHEET

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Percent Similarity

	1	2	3		
1		87.1	79.1	1	24DNT-45DO.ISP-L.prot
2	13.0		83.3	2	2NT-23DO.ISP-L.prot
3	21.7	17.9		3	NDO-PpG7.ISP-L.prot
	1	2	3		

**FIG. 12A**



**FIG. 12B**

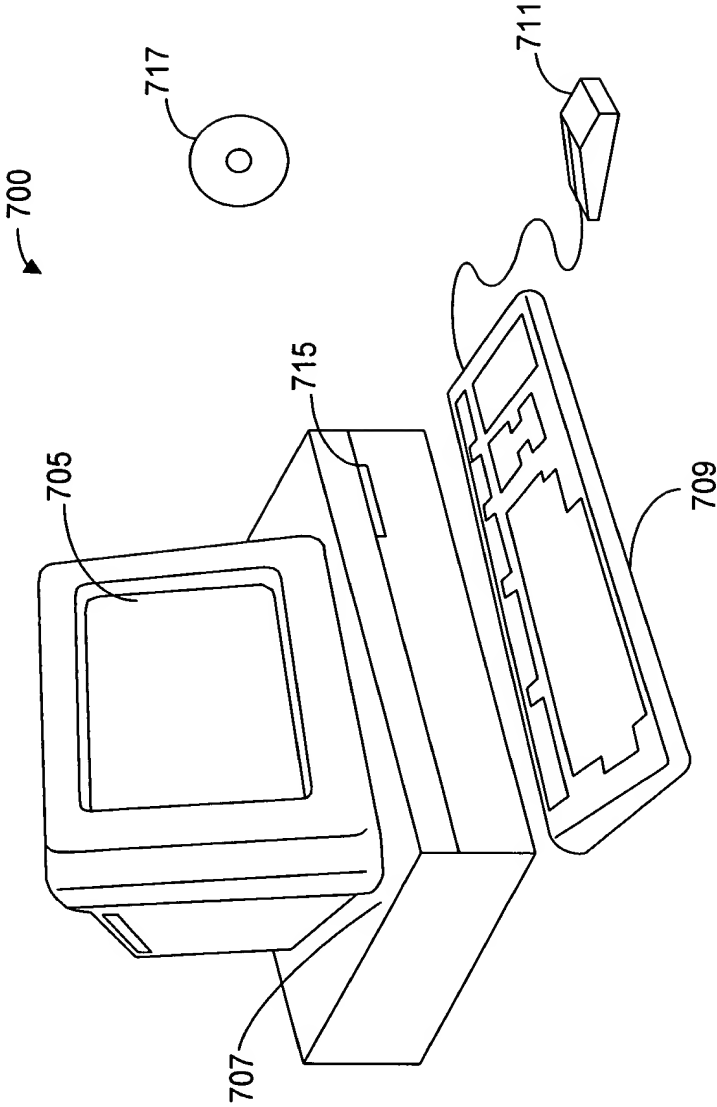
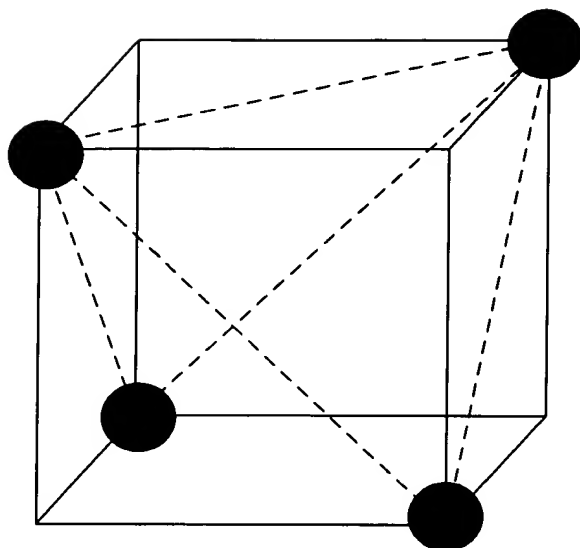


FIG. 13



# REPLACEMENT SHEET

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Geometric representation  
Equal distance between  
each nucleotide

**FIG. 14A**

A	-1 -1 +1
C	+1 -1 -1
G	-1 +1 -1
T	+1 +1 +1

Numeric representation

**FIG. 14B**



REPLACEMENT SHEET

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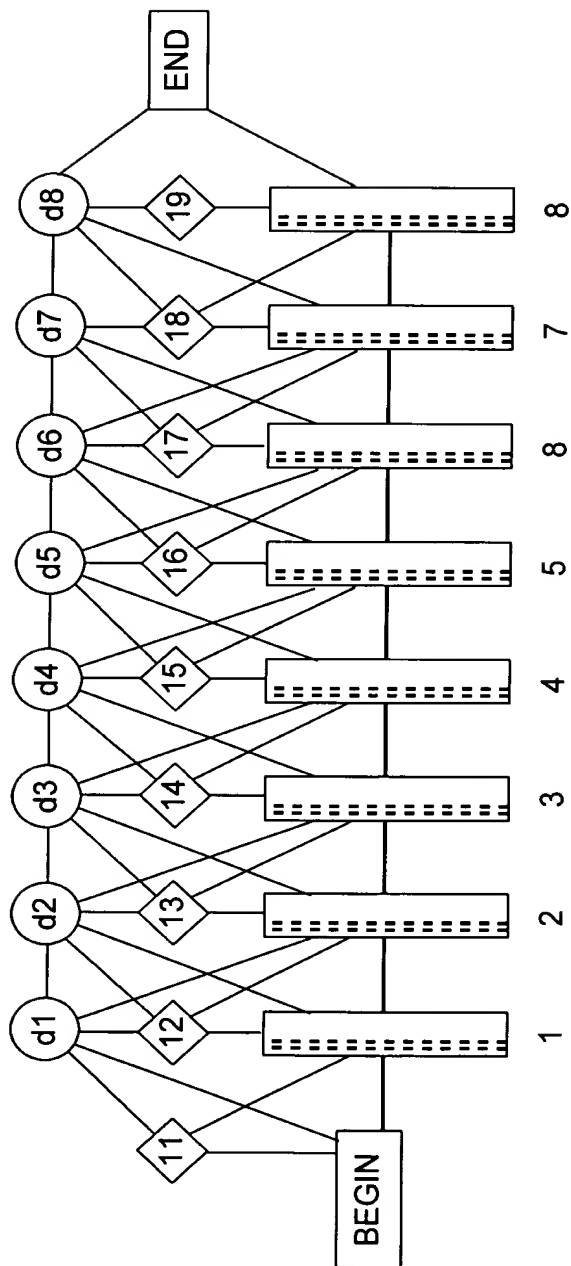


FIG. 15